

XXVIII.—*Some Facts bearing on the Affinities of Smithornis.*

By G. L. BATES, M.B.O.U.

(Plate XVIII. & Text-figure 8.)

THIS short paper is written to indicate a few anatomical and other characters of the African genus *Smithornis*, hitherto placed among the Muscicapidæ, which prove that it cannot belong to that family, or, indeed, to the normal Passeres at all.

If a personal note is not out of place at the beginning, it may be said that the writer has only recently begun, with the help of the 'Vögel' of Bronn's 'Tierreich' and of the articles by Dr. Gadow in Newton's 'Dictionary of Birds,' to make a more thorough study of the birds of this part of Africa (*i. e.* Kamerun) than that involved in the collection and identification of specimens. The somewhat scanty observations here recorded are the fruits of that study.

A brief account of the distribution and habits of the different species of *Smithornis* will serve to bring the birds in question before the reader. The first species known was *S. capensis*, which, in spite of its name, is mainly east African, and seems not to be found nearer the Cape than Natal; but it has been found also in Angola, and recently, by Mr. Neave, in the extreme southern part of Belgian Congo. *S. rufolateralis*, the smaller of the two forest species, has also been long known, and has a range very extensive in longitude, from Liberia on the west to Lake Albert on the east, but very narrow in latitude. *S. sharpei*, the largest species, was discovered by Alexander on Fernando Po in 1902, and is figured in 'The Ibis' for July, 1903. About the same time it was found also in southern Kamerun by Zenker and also by the writer; and a little later, far to the east, by the Ruwenzori Expedition. *S. camarunensis*, described by Sharpe from the writer's collection in Kamerun and later found by the Ruwenzori Expedition, closely resembles *S. capensis*, and perhaps should be regarded as a geographical race of that

species, well marked by the deeper coloration, attributable to its having become a resident of the forest region. In Kamerun it is a bird of the waste cultivated ground or second-growth forest, never found in the primitive forest, to which the other two species are confined.

The sketch-map (Plate XVIII.) shows very clearly the distribution of the four recognised species of *Smithornis*, and the following is a list of recorded localities which are numbered to correspond with those on the map. B.M. indicates examples in the British Museum.

Smithornis capensis.

Platyrhynchus capensis Smith, Ill. Zool. S. Afr., Aves, pl. 27, 1839: forests towards Delagoa bay.

Smithornis capensis albogularis Hartert, Bull. B.O.C. xiv. 1904, p. 73: Canhoça, N. Angola.

Brit. East Africa—1 Kikuyu (Neumann); German East Africa—2 Kahi (Neumann), 3 Usaramo, 4 Lindi (Fischer), 5 Ukinga (Fülleborn), 6 Rovuma river, B.M. (Thomson); Nyasaland—7 Fort Hill, B.M., 8 Ntondini, B.M. (Sharpe), 9 Zomba, B.M., 10 Milanji, B.M. (Whyte), 11 Ruo river, B.M. (Percival); Portuguese E. Africa—12 Coguno, B.M., 13 Beira, B.M., 14 Tambarara, B.M. (Grant), 15 Delagoa bay (Smith); Natal—16 Zululand (Woodward), 17 Durban, B.M. (Gordge), 18 Pinetown (Ayres); South Rhodesia—19 Chirinda, B.M., 20 Jihu river, B.M. (Swynnerton); N.E. Rhodesia—21 Loangwa river, B.M. (Neave); Belgian Congo—22 Bunkeya, B.M., 23 Dikulwe valley, B.M. (Neave); Angola—24 Canhoça and 25 Ndala Tando, B.M. (Ansorge).

Smithornis camarunensis.

Smithornis camarunensis Sharpe, Ibis, 1905, p. 469: River Ja, Kamerun.

Kamerun—26 River Ja, B.M. (Bates); Uganda; 27 Mpanga forest, B.M. (Woosnam).

Smithornis rufolateralis.

Smithornis rufolateralis Gray, P. Z. S. 1864, p. 143, pl. xvi: "West Africa," exact locality unknown.

Liberia—28 Hilltown Wifla and Galilee Mt. (Büttikofer



and Stampfli); **Gold Coast**—29 Fantee and Denkera, B.M. (Ussher), 30 Wassaw, B.M. (Blissett), 31 Fumsu, B.M. (Alexander); **Togoland**—32 Misahöhe (Baumann), 33 Bismarckburg (Büttner); **Kamerun**—34 Victoria (Preuss), 35 Ekundu (Sjöstedt), 36 Yaunde, 37 Bipindi (Zenker), 38 River Ja, B.M., 39 Efulen, B.M., 40 Zima country, B.M. (Bates); **Belgian Congo**—41 Irumu (Emin), 42 Mawambi, Congo forest, B.M. (Woosnam); **Uganda**—43 Bugoma forest, B.M. (Christy).

Smithornis sharpei.

Smithornis sharpei Alexander, Bull. B. O. C. xiii. Jan. 30, 1903, p. 34: Mt. St. Isabel, Fernando Po.

Smithornis zenkeri Reichenow, Orn. Monatsb. xi. Mch. 1, 1903, p. 41: Bipindi, Kamerun.

Fernando Po—44 Mt. St. Isabel, B.M. (Alexander), 45 Bantebari, B.M. (Seimund); **Kamerun**—46 Bipindi (Zenker), 47 River Ja, B.M., and 48 Efulen, B.M. (Bates); **Belgian Congo**—49 near Fort Beni, Semliki valley, B.M. (Woosnam).

Thus the species of the genus *Smithornis*, if we consider *S. capensis* and *S. camarunensis* as geographical races of the same species, follow the general rule found among the birds of Kamerun, that those species that have a wide African distribution are inhabitants of the farms about the villages or of second-growth forest, while species peculiar to the Forest Region are strictly birds of the primitive forest. The kind of country frequented by each species of *Smithornis* can be seen even from the materials used in making the hanging, pocket-shaped nests, which in shape and structure are exactly alike throughout the genus; for nests of *S. camarunensis* are made of the fibres of weeds or plantains, while those of the other two species are of forest materials, such as moss. The plumage of the two forest species shows a considerable amount of bright colour; while that of the species of east and south Africa is mostly olive-brown and black, the form of it found in the forest region (*S. camarunensis*) having a little more of the black than the other.

The habit of all these birds is to sit silently in dark places

in the forest, trusting to their stillness and the imperfect light for protection. But they are not always silent, for they make, at times, a very peculiar noise, which may be described as a long-continued trilled "r" accompanied by a voice-note, but is perhaps harsher than that description would imply; the adjective "grinding" has been appropriately applied to it. This noise is imitated by the natives of this country by making the protruded lips vibrate while uttering the note. It is evidently not a sound made with the ordinary avian vocal organs used in the ordinary way. All the species make this noise. It is made only while the bird is in the air, taking a short circular flight from its perch and back again, at the same time vibrating its wings rapidly and displaying the white patch at other times hidden in the plumage of its back. The whole performance seems well calculated to be a mating-call and display of the male to attract the female. When, drawn by the noise, which can be heard at a distance, the mate approaches near enough, she can see the white patch twinkling in the thicket, where the bird would be invisible if sitting still. I have seen no evidence that this noise is made by the female bird, and I should consider this unlikely. Two birds, or even three, that may often be heard, in different directions, answering one another, are more likely rival males. These grinding calls are kept up at intervals of a minute or less, in early morning and late evening, and sometimes at other hours on dark days. I have never heard a bird of any of the species of *Smithornis* make any other call or sound; but for a reference to another cry made by *S. capensis*, see Mr. Claude Grant's account in 'The Ibis,' 1911, p. 422.

In connection with the display of the white patch in the back-plumage it may be added that the patch is present, but small in females, and that it is absent in young birds.

Now will be given the promised anatomical facts.

Syrinx.—It was the peculiar noise made by the birds belonging to the genus *Smithornis*, and their apparent inability to utter any kind of song such as most or all Flycatchers sometimes utter, even though usually silent, that led me

first to look at the lower end of the trachea and the organ of voice. It was seen at once that the syrinx was bare or nearly bare of muscles lower down than the point where the sterno-tracheal muscles leave the trachea, to go to either anterior lateral process of the sternum. This was confirmed in a considerable number of specimens belonging to all three species of *Smithornis*; but I do not feel able to make a full description of the syrinx. Regarding one example of *S. sharpei* the following note was written down at the time: "Alongside the sterno-tracheal muscles where these leave the trachea, and ventrally from them, run some thin muscular strands continuing on down the trachea to the beginning of the bronchi. These are so thin as to be made out with difficulty, and no other muscles are to be seen on the syrinx." Of most of the specimens examined I was content to say that no muscles could be made out attached to the lower end of the trachea or the bronchi.

Deep Plantar Tendons.—Another discovery was made on dissecting the leg and foot of a specimen of *S. camarunensis*, and finding the flexor muscles of the toes with their tendons; a slender vinculum was found running downwards from the tendon of the *M. flexor hallucis* and joining that of the *M. flexor profundus* just above the point where the latter divides into branches to the three forward toes. When the tendon of the *flexor hallucis* was pulled, all the toes were bent, though not quite simultaneously, for the hallux was moved a little in advance of the other toes; when the tendon of the *profundus* was pulled, the three forward toes were bent, while the hallux was not moved. This observation was confirmed in a number of cases, with birds belonging to this and the other two species as well, and the presence of the vinculum was ascertained either by dissecting the foot so that it could be seen, or by noting the effect on the toes of pulling the tendons. But a bird of the species *S. rufolateralis* that was skinned on one of the days while this paper was being prepared, seemed to afford an exception, for pulling the tendon of the *flexor hallucis* affected the hallux only, in both feet alike. In this

specimen the vinculum was either absent or so slight that it was easily broken. This case seems to show that the character of the vinculum is somewhat variable. But there is no doubt about its presence in the other specimens examined.

According to Gadow, this vinculum is found, among Passeriformes, only in the Eurylæmidæ.

Sternum.—While I think that a comparison of thoroughly-cleaned sterna of *Smithornis* with those of other genera of Passeres would show interesting though slight differences, only one point can be stated now, and it is a point of similarity and not of difference. The *spina sternalis* is deeply forked or Y-shaped, as in most Passeriformes. Gadow's statement regarding the Eurylæmidæ is "*Spina externa* long but simple, with rounded tip or scarcely indicated fork."

Tongue.—The tongue in *Smithornis* is not only broad, to suit the shape of the bill, but markedly thick and fleshy, though with thin edges. In this fleshy tongue is perhaps to be found the clue to the mystery of the way in which the bird's peculiar noise is produced.

A character found in one of the little bones of the hyoid apparatus in Passerine birds, though I have never seen a reference to it in any book, can be given here with some confidence as being important because constant. It has been my custom for a good while to pull out (when it was not too much trouble) the tongues of birds skinned, and to remove as much of the muscle on the hyoid bones as could be quickly done, and dry and label these tongues with the bones attached. Thus quite a collection of birds' tongues has been formed. A comparison of these shows that the little urohyal bone, situated between the bases of the hyoid horns and lying with point downwards, when in position in the bird, against the front of the thyroid cartilage, has a peculiar shape in all normal Passeres. In these the free end of the urohyal is very flat with a thin border of cartilage at the edges and tip. The amount of this flattening and widening varies among the families of Passeres, but there is similarity in this regard between members of each family. The Pycnonotidæ have the urohyal the widest and flattest of any of the birds I have observed, and the

Muscicapidæ the least so; but even where least marked, the characteristic shape is unmistakably seen. It seems to be a special development by which the little bone is made to fit more perfectly to the cartilage of the throat. In other orders of birds the tip of the urohyal has no flat margin, but is a little rod or point, often slightly bent to one side. In the tongue of *Smithornis*, the tip of the urohyal is rod-shaped and not flattened at the edges.

Podotheca.—The covering of the metatarsus in *Smithornis* (Text-figure 8, B) is different from that found in normal Passeres, in that there are no horny plates or scutes on the posterior part, but only horny granulations or tubercles situated on the hinder edge. Six or seven large scutes in a single row form the covering of the front of the metatarsus; between these and the granulations behind, on either side, is bare skin.

Toes.—The second and third toes have most of the first joint united by a web. The third and fourth toes are firmly united as far as the distal end of the second joint of the fourth or the middle of the second joint of the third, and loosely united by a web a little farther.

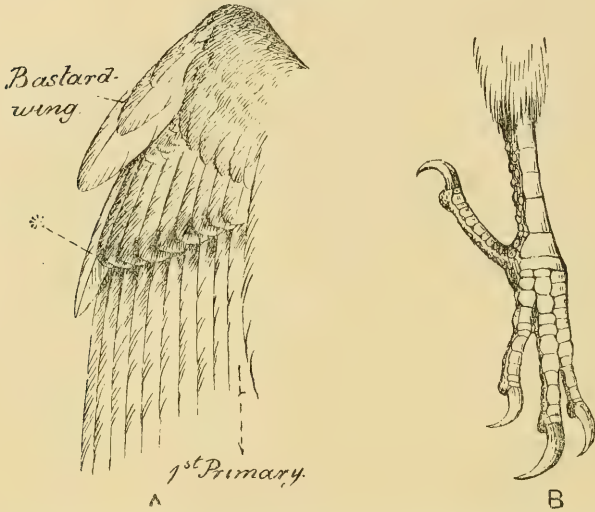
Aftershaft.—Not the least interesting fact discovered with regard to the birds under consideration, is the seeming absence of any aftershaft to the feathers. On examination of feathers from birds of all three species of *Smithornis*, no aftershaft—not even a rudimentary one large enough to be seen without a microscope—has been found.

Pterylography of the Wing.—The number of the remiges is not peculiar in *Smithornis*. There are, on the cubitus, nine, and in some cases—perhaps regularly in some species—a tenth small one near the elbow-joint; there are eleven (Text-figure 8, A) on the manus, that is, ten functional ones and the remicle. The remicle, in a number of specimens of *S. camarunensis*, was found to vary much in length, but to average about 5 millimetres; in two specimens of *S. sharpei* it measured 5 or 6 millimetres; in two of *S. rufolateralis*, 2 or 2.5 millimetres.

Of the wing-coverts, only a peculiarity in the relative lengths of the major upper coverts is to be described. The

outermost, or tenth one of this series, at the tip of the wing, which in all other birds that I have examined is the shortest, I have found in *Smithornis* to be the longest of all. The others grow gradually shorter from the carpal joint to the tip of the wing, as this row of coverts does in all birds ;

Text-fig. 8.



- A. Upper surface of manus of left wing of *Smithornis rufolateralis* (long outer or 10th major covert marked with an asterisk).
 B. Right foot of *Smithornis camarunensis*, to show podotheca.

but when the tenth and last one is reached, it is found to be not only longer than those next to it, but even longer than the one next the carpal joint. The measured lengths of these feathers in one wing of a *Smithornis camarunensis* is here given as typical of a number of wings examined from all the three species :—

First major upper covert on the manus	16 mm.
Ninth	„ „ „ „ „ 10 „
Tenth	„ „ „ „ „ 17 „

This tenth major upper covert on the manus is, I think, to be regarded as the covert of the tenth remex, and not of the remicle, these coverts being situated each on the distal side of its remex.